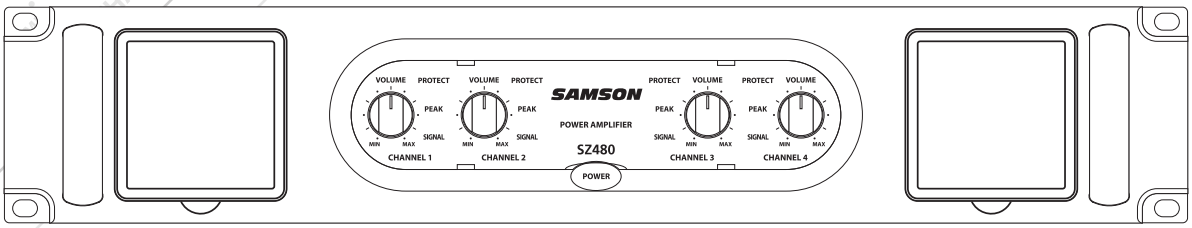
SZ240
SZ480

SZ SERIES

POWER AMPLIFIERS



Owners Manual

SAMSON®

WARNING

TO PREVENT FIRE OR SHOCK HAZARD. DO NOT USE THIS PLUG WITH AN EXTENON CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PRESENT BLADE EXPOSURE.
TO PREVENT FIRE OR SHOCK HAZARD. DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
TO PRVENT ELECTRICAL SHOCK, MATCH WIDE BLADE PLUG TO WIDE SLOT FULLY INSERT.

This lightnig flash with arrow-head symbol, within an equi-lateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

Warning: To reduce the risk of electric shock, do not remove cover (or back) no user-serviceable parts inside. Refer serving to qualified service personnel.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventiation openings. Install in accordance with the manufacture’s instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other appartus (including amplifiers) thar produce heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protest the power cord from being walked on or pinched particulary at the plugs, convenience receptacles, and at the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug the apparatus during lightening sort or when unused for long periods of time.
    Refer all servicing to qualified personnel. Serving is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus has been exposed to rain or moisture, does not operate normally, or has been
14. dropped.
    This appliance shall not be exposed to dripping or splashing water and that no object filled with liquid
15. such as vases shall be placed on the apparatus.
16. Caution-to prevent elecrical shock, match wide blade plug wide slot fully insert.
17. Please keep a good ventilation environment around the entire unit.

Safety Instructions/Consignes de sécurité/Sicherheitsvorkehrungen/Instrucciones de seguridad

WARNING: To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture. To reduce the hazard of electrical shock, do not remove cover or back. No user serviceable parts inside. Please refer all servicing to qualified personnel.The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Important Safety Instructions

1. Please read all instructions before operating the unit.
2. Keep these instructions for future reference.
3. Please heed all safety warnings.
4. Follow manufacturers instructions.
5. Do not use this unit near water or moisture.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturers instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. When the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on and pinched particularly at plugs, convenience receptacles and at the point at which they exit from the unit.
11. Unplug this unit during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified personnel. Servicing is required when the unit has been damaged in any way, such as power supply cord or plug damage, or if liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

ATTENTION: Pour éviter tout risque d'électrocution ou d'incendie, ne pas exposer cet appareil à la pluie ou à l'humidité. Pour éviter tout risque d'électrocution, ne pas ôter le couvercle ou le dos du boîtier. Cet appareil ne contient aucune pièce remplaçable par l'utilisateur. Confiez toutes les réparations à un personnel qualifié. Le signe avec un éclair dans un triangle prévient l'utilisateur de la présence d'une tension dangereuse et non isolée dans l'appareil. Cette tension constitue un risque d'électrocution. Le signe avec un point d'exclamation dans un triangle prévient l'utilisateur d'instructions importantes relatives à l'utilisation et à la maintenance du produit.

Consignes de sécurité importantes

1. Veuillez lire toutes les instructions avant d'utiliser l'appareil.
2. Conserver ces instructions pour toute lecture ultérieure.
3. Lisez avec attention toutes les consignes de sécurité.
4. Suivez les instructions du fabricant.
5. Ne pas utiliser cet appareil près d'une source liquide ou dans un lieu humide.
6. Nettoyez l'appareil uniquement avec un tissu humide.
7. Veillez à ne pas obstruer les fentes prévues pour la ventilation de l'appareil. Installez l'appareil selon les instructions du fabricant.
8. Ne pas installer près d'une source de chaleur (radiateurs, etc.) ou de tout équipement susceptible de générer de la chaleur (amplificateurs de puissance par exemple).
9. Ne pas retirer la terre du cordon secteur ou de la prise murale. Les fiches canadiennes avec polarisation (avec une lame plus large) ne doivent pas être modifiées. Si votre prise murale ne correspond pas au modèle fourni, consultez votre électricien.
10. Protégez le cordon secteur contre tous les dommages possibles (pincement, tension, torsion,, etc.). Veillez à ce que le cordon secteur soit libre, en particulier à sa sortie du boîtier.
11. Déconnectez l'appareil du secteur en présence d'orage ou lors de périodes d'inutilisation prolongées.
12. Consultez un service de réparation qualifié pour tout dysfonctionnement (dommage sur le cordon secteur, baisse de performances, exposition à la pluie, projection liquide dans l'appareil, introduction d'un objet dans le boîtier, etc.).

ACHTUNG: Um die Gefahr eines Brandes oder Stromschlags zu verringern, sollten Sie dieses Gerät weder Regen noch Feuchtigkeit aussetzen.Um die Gefahr eines Stromschlags zu verringern, sollten Sie weder Deckel noch Rückwand des Geräts entfernen. Im Innern befinden sich keine Teile, die vom Anwender gewartet werden können. Überlassen Sie die Wartung qualifiziertem Fachpersonal.Der Blitz mit Pfeilspitze im gleichseitigen Dreieck soll den Anwender vor nichtisolierter "gefährlicher Spannung" im Geräteinnern warnen. Diese Spannung kann so hoch sein, dass die Gefahr eines Stromschlags besteht. Das Ausrufezeichen im gleichseitigen Dreieck soll den Anwender auf wichtige Bedienungs- und Wartungsanleitungen aufmerksam machen, die im mitgelieferten Informationsmaterial näher beschrieben werden.

Wichtige Sicherheitsvorkehrungen

1. Lesen Sie alle Anleitungen, bevor Sie das Gerät in Betrieb nehmen.
2. Bewahren Sie diese Anleitungen für den späteren Gebrauch gut auf.
3. Bitte treffen Sie alle beschriebenen Sicherheitsvorkehrungen.
4. Befolgen Sie die Anleitungen des Herstellers.
5. Benutzen Sie das Gerät nicht in der Nähe von Wasser oder Feuchtigkeit.
6. Verwenden Sie zur Reinigung des Geräts nur ein feuchtes Tuch.
7. Blockieren Sie keine Belüftungsöffnungen. Nehmen Sie den Einbau des Geräts nur entsprechend den Anweisungen des Herstellers vor.
8. Bauen Sie das Gerät nicht in der Nähe von Wärmequellen wie Heizkörpern, Wärmeklappen, Öfen oder anderen Geräten (inklusive Verstärkern) ein, die Hitze erzeugen.
9. Setzen Sie die Sicherheitsfunktion des polarisierten oder geerdeten Steckers nicht außer Kraft. Ein polarisierter Stecker hat zwei flache, unterschiedlich breite Pole. Ein geerdeter Stecker hat zwei flache Pole und einen dritten Erdungsstift. Der breitere Pol oder der dritte Stift dient Ihrer Sicherheit. Wenn der vorhandene Stecker nicht in Ihre Steckdose passt, lassen Sie die veraltete Steckdose von einem Elektriker ersetzen.
10. Schützen Sie das Netzkabel dahingehend, dass niemand darüber laufen und es nicht geknickt werden kann. Achten Sie hierbei besonders auf Netzstecker, Mehrfachsteckdosen und den Kabelanschluss am Gerät.
11. Ziehen Sie den Netzstecker des Geräts bei Gewittern oder längeren Betriebspausen aus der Steckdose.
12. Überlassen Sie die Wartung qualifiziertem Fachpersonal. Eine Wartung ist notwendig, wenn das Gerät auf irgendeine Weise, beispielsweise am Kabel oder Netzstecker beschädigt wurde, oder wenn Flüssigkeiten oder Objekte in das Gerät gelangt sind, es Regen oder Feuchtigkeit ausgesetzt war, nicht mehr wie gewohnt betrieben werden kann oder fallen gelassen wurde.

PRECAUCION: Para reducir el riesgo de incendios o descargas, no permita que este aparato quede expuesto a la lluvia o la humedad. Para reducir el riesgo de descarga eléctrica, nunca quite la tapa ni el chasis. Dentro del aparato no hay piezas susceptibles de ser reparadas por el usuario. Dirija cualquier reparación al servicio técnico oficial. El símbolo del relámpago dentro del triángulo equilátero pretende advertir al usuario de la presencia de "voltajes peligrosos" no aislados dentro de la carcasa del producto, que pueden ser de la magnitud suficiente como para constituir un riesgo de descarga eléctrica a las personas. El símbolo de exclamación dentro del triángulo equilátero quiere advertirle de la existencia de importantes instrucciones de manejo y mantenimiento (reparaciones) en los documentos que se adjuntan con este aparato.

Instrucciones importantes de seguridad

1. Lea todo este manual de instrucciones antes de comenzar a usar la unidad.
2. Conserve estas instrucciones para cualquier consulta en el futuro.
3. Cumpla con todo lo indicado en las precauciones de seguridad.
4. Observe y siga todas las instrucciones del fabricante.
5. Nunca utilice este aparato cerca del agua o en lugares húmedos.
6. Limpie este aparato solo con un trapo suave y ligeramente humedecido.
7. No bloquee ninguna de las aberturas de ventilación. Instale este aparato de acuerdo a las instrucciones del fabricante.
8. No instale este aparato cerca de fuentes de calor como radiadores, calentadores, hornos u otros aparatos (incluyendo amplificadores) que produzcan calor.
9. No anule el sistema de seguridad del enchufe de tipo polarizado o con toma de tierra. Un enchufe polarizado tiene dos bornes, uno más ancho que el otro. Uno con toma de tierra tiene dos bornes normales y un tercero para la conexión a tierra. El borne ancho o el tercero se incluyen como medida de seguridad. Cuando el enchufe no encaje en su salida de corriente, llame a un electricista para que le cambie su salida anticuada.
10. Evite que el cable de corriente quede en una posición en la que pueda ser pisado o aplastado, especialmente en los enchufes, receptáculos y en el punto en el que salen de la unidad.
11. Desconecte de la corriente este aparato durante las tormentas eléctricas o cuando no lo vaya a usar durante un periodo de tiempo largo.
12. Dirija cualquier posible reparación solo al servicio técnico oficial. Deberá hacer que su aparato sea reparado cuando esté dañado de alguna forma, como si el cable de corriente o el enchufe están dañados, o si se han derramado líquidos o se ha introducido algún objeto dentro de la unidad, si esta ha quedado expuesta a la lluvia o la humedad, si no funciona normalmente o si ha caído al suelo.

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Printed June, 2007 v1.0

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Introduction

Thank you for purchasing the SZ240 and SZ480 constant voltage power amplifiers from Samson Technologies! The Samson SZ Series amplifiers have been designed to provide robust, clean output with low distortion and wide dynamic range, along with the dependability demanded by the most professional design engineers and audio installers. The two-channel SZ240 and the four-channel SZ480 are both enclosed in a convenient 2 rack-space chassis and feature highly efficient Class D power cores with universal power supplies that operate from 100 – 240 volts, at 50 or 60 Hz. Each of the SZ amp channels reach full power of 120 watts at 4 ohms, but they can also run at 70 or 100 volts thanks to their internal, high performance, toroidal matching transformers. Front panel controls and displays include a Power switch with LED indicator, as well as independent channel input level controls. The SZ amplifiers include front panel Signal, Peak and Protection LED indicators to help you set the correct operating levels. Plus, the SZ amplifiers include a selectable Limiter on each channel to help guarantee a clean signal. Euro block input and output connectors are provided to insure easy connections and maximum flexibility. To keep the SZ amplifiers running cool, their designs employ internal wind tunnels with forced-air cooling via an internal fan, which greatly reduces the chance of thermal and overheating problems. Multi-stage protection for power-up, overheating, over-current, short circuit, low output impedance and DC voltage, assures high reliability under the most demanding situations. The SZ amps are road tough with their all steel chassis, 19-inch rack mount design and convenient carry handles facilitating easy installation in any rack. Optimized for commercial installations, houses of worship, live sound venues and for driving small and medium-sized live PA systems, the SZ amplifiers will deliver reliable power. The SZ series' advanced technology, clear sound and reliable performance makes them ideal for any small PA or any distributed sound system installation.

In this manual, you'll find a detailed description of the features of the SZ Amplifiers, as well as a guided tour through the front and rear panels, step-by-step instructions for using the unit, suggested applications and full specifications.

You'll also find a warranty card enclosed—please don't forget to fill it out and mail it so that you can receive online technical support and so we can send you updated information about other Samson products in the future. Also, be sure to check out our website (www.samsontech.com) for complete information about our full line of Samson audio products.

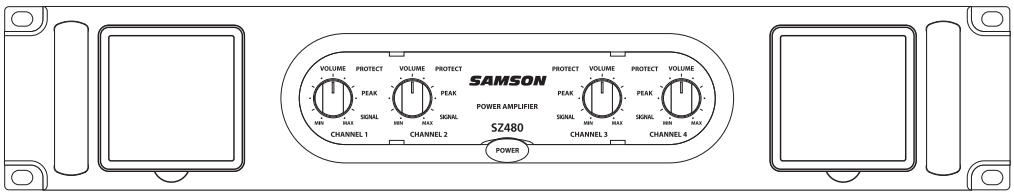
With proper care and adequate air circulation, your SZ amplifer will operate trouble free for many years. We recommend you record your serial number in the space provided below for future reference.

Serial number: _____

Date of purchase: _____

Should your unit ever require servicing, a Return Authorization number (RA) must be obtained before shipping your unit to Samson. Without this number, the unit will not be accepted. Please call Samson at 1-800-3SAMSON (1-800-372-6766) for a Return Authorization number prior to shipping your unit. Please retain the original packing materials and if possible, return the unit in the original carton and packing materials. If you purchased your Samson product outside the United States, please contact your local distributor for warranty information and service.

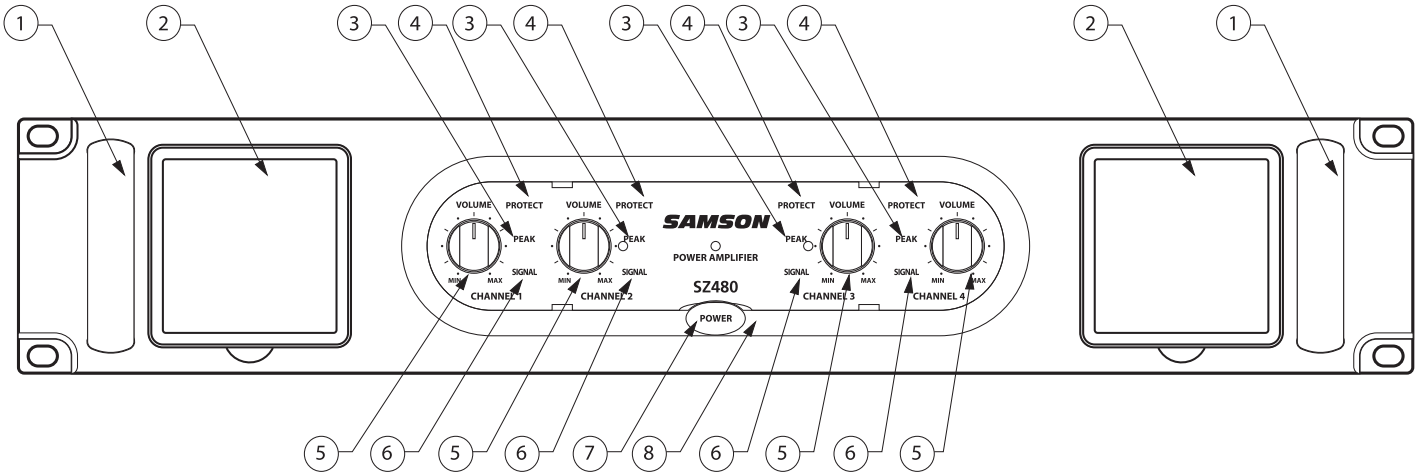
SZ Series Features



The Samson SZ240 and SZ480 power amplifiers have been developed using the latest technology in Class D power amplifier design. Here are some of their main features:

- Each SZ Series amplifier delivers 120 watts of clean power per channel at 70/100 volts and 4 Ohms, with 2 x 120 watts for the SZ240 and 4 x 120 watts for the SZ480.
- Class D amplifier operating at 85% efficiency using universal power supplies with power factor correction and capable of operating from 100-240 V, 50 or 60 Hz. The SZ series amplifiers generate virtually no heat and thanks to their low current draw, several SZ series can run off a single power outlet.
- Built-in 70/100 volt output transformers with flat frequency response from 40Hz to 20kHz provide constant voltage for distributed speaker systems.
- Independent input level controls for each channel allow precision adjustments and the included security panel provides protection from unwanted adjustment.
- Clean, crisp sound - Impressive audio specifications such as 0.04% THD, dynamic range of 105 dB, crosstalk of 80 dB, and frequency response of 10 Hz to 25 kHz guarantee ultra-clean sound quality.
- LED signal indicators for each channel continuously display power output levels and allow you to correct for overloading (clipping) conditions.
- Forced air cooling via internal fan provides reliable performance without thermal and overheating problems.
- Protection relay circuitry (with dedicated LEDs for each channel) that guards against overheating or faulty wiring conditions and also prevents “thumps” when powering on or off. This means that you can use the SZ Series with a single power strip, into which a mixer or other audio devices are connected, without danger of damage to connected speakers.
- Input connections for each channel are made using Euroblock connectors to accommodate both balanced and unbalanced signals sources.
- Output connections for each channel are made using Euroblock connectors which accept 12 gauge wire.
- The SZ Series can be mounted in any standard 19" rack (taking just two rack spaces), making it easy to integrate into any fixed or traveling PA rig.
- The amplifiers are enclosed in ruggedly construction (an all-steel chassis with a sleek black finish), standard 2-space 19-inch rack mount unit.
- Extended three-year warranty.

SZ480 Layout - Front Panel



1: Handle - For easy transport while carrying, or while rack mounting, the SZ amplifier features two heavy duty die cast handles located conveniently on the left and right side of the front panel.

2: Fan Vent - The SZ amplifiers stay cool thanks to their twin, forced-air cooling vents. Cool air is drawn through the front panel fan filters, reducing the temperature of the internal components while forcing the heat out the rear vents.

3: Peak LED - The PEAK segment lights whenever the channel is outputting signal at full strength. For the best signal-to-noise ratio, the right (PEAK) segment should light occasionally during peak levels; if it lights frequently, you may be overloading the SZ Series and a distorted ("clipped") signal is probably being output.

4 : Protection LED - This goes on for approximately five seconds whenever the SZ Series is powered on and then turns off (you'll hear a "click" when it does so). The Protection LED will also light when overheating or other severe problems occur (see page 11 in this manual for more information). It is normal for the Protection LED to fade slowly when the amp is powered off. When lit, no signal is provided to any connected speakers, thus muting them and preventing any "thump" from occurring. For a complete description of the conditions under which this light goes on, see the section entitled "The SZ Series Protection Circuitry" on page 11 of this manual.

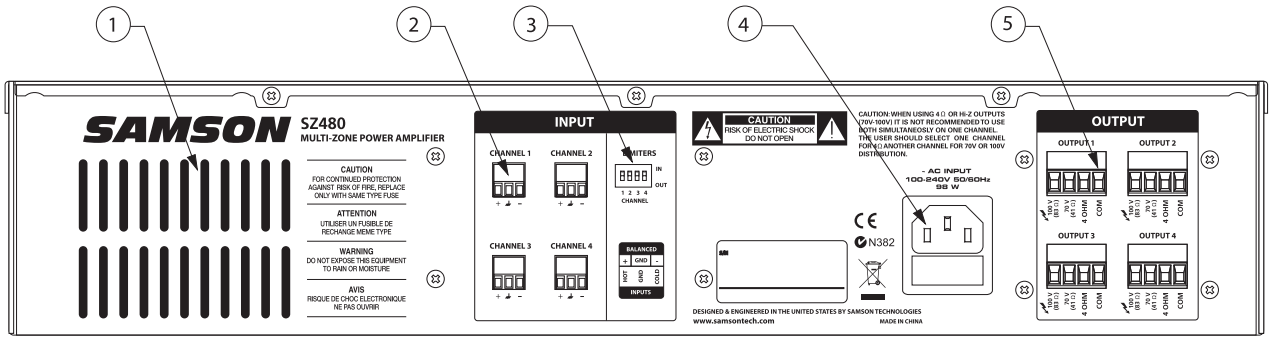
5: Channel input level controls - These 42-position detented controls allow you to precisely adjust the input level of the signal arriving at the rear-panel input connectors (see #2 on the following page). At their fully counterclockwise position (labeled "MIN"), the signal is attenuated by 80 dB (essentially completely off). At their fully clockwise position (labeled "MAX"), the signal is at unity gain (that is, no attenuation). When +4 dBu of signal arrives at the input jacks and the Channel input level controls are set to their fully clockwise " 0 dB" position, the SZ Series delivers full power output.

6: Signal LED - The front panel LED indicators continuously monitor the power output level for the corresponding channel. The SIGNAL LED lights whenever output signal is present.

7: Power switch - Use this to power the SZ Series on or off. The internal LED lights whenever the SZ Series is powered on.

8: Security panel - The removable clear acrylic panel provides easy front panel access to the volume controls and helps protect against unwanted changes by unauthorized users.

SZ480 Layout - Rear Panel



1: Fan - This internal fan provides vital cooling to your SZ Series. Make sure that both the front and rear panels are kept free of all obstructions and that cool, fresh air is accessible at all times. Also, try to ensure that the SZ Series is used in a dust-free environment.

2: Euroblock Input connectors - Connect incoming signals to these electronically balanced connectors. We recommend the use of balanced three-conductor cabling wherever possible (unbalanced two-conductor signals can also be inserted into these inputs, but you'll get better signal quality and less outside noise and hum if you use balanced lines). The SZ Series accepts input levels of any strength but needs at least +4 dBu to achieve maximum power. See page 14 in this manual for full interconnection instructions.

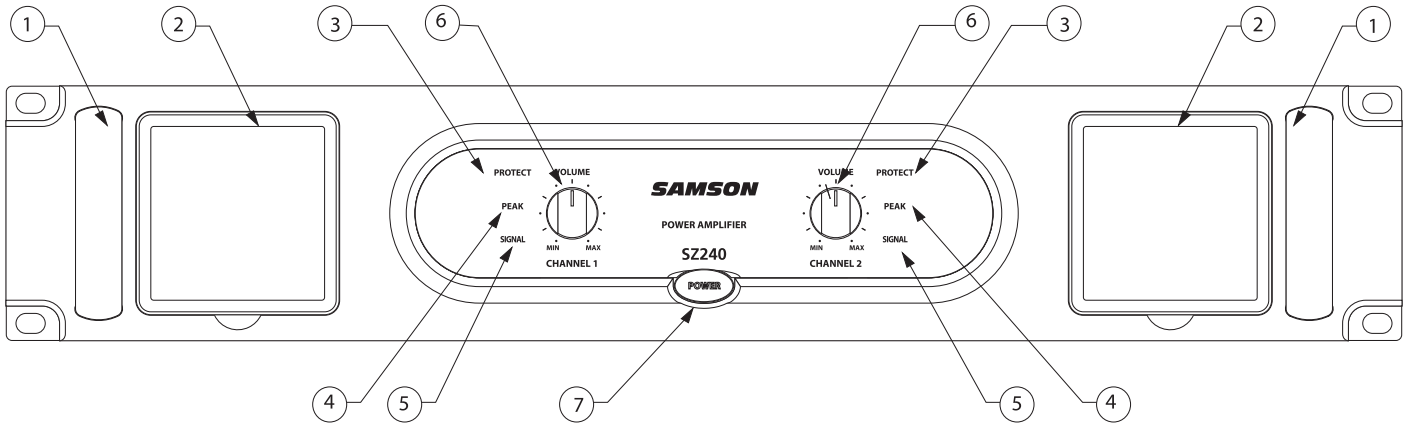
3: Limiter-Each amplifier channel has a quick attack Limiter with peak detection to help ensure a clean signal. The Limiter for each individual channel can be set to "on or off" using the rear panel dip switches. In order to maximize speaker protection, we recommend that this switch be left in the "on" position during normal operation.

4: AC input - Connect the supplied heavy-gauge 3-pin "IEC" power cable here.

5: Euroblock Output connectors - Use these to connect each channel of the SZ Series to 4-ohm or 8-ohm loudspeakers, or to one of the 70 and 100 volt outputs if you are using a constant voltage system . See page 15 in this manual for more information about wiring and interconnection instructions.

WARNING!: Each of the SZ series amplifier channels can run only one output configuration at the same time. Operating SZ amplifiers using 4 ohm and 70 or 100 volt concurrently may cause damage to the amplifier or connected speakers, and may void your warranty.

SZ240 Layout - Front Panel



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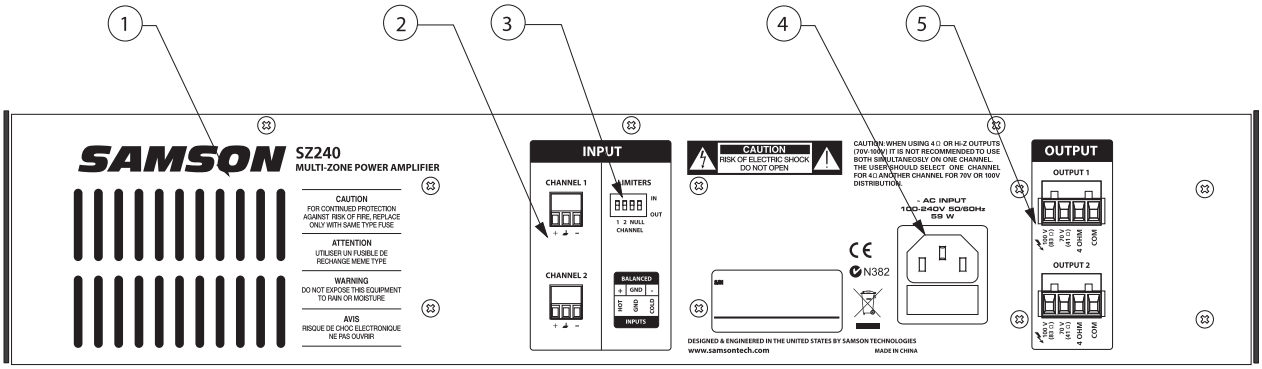

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Designing an Installation Plan

Designing an Installation Plan

If you are a professional installer, you'll probably want to skip over this section, however if you are setting up your system for the first time, this section can help make your installation a little bit easier.

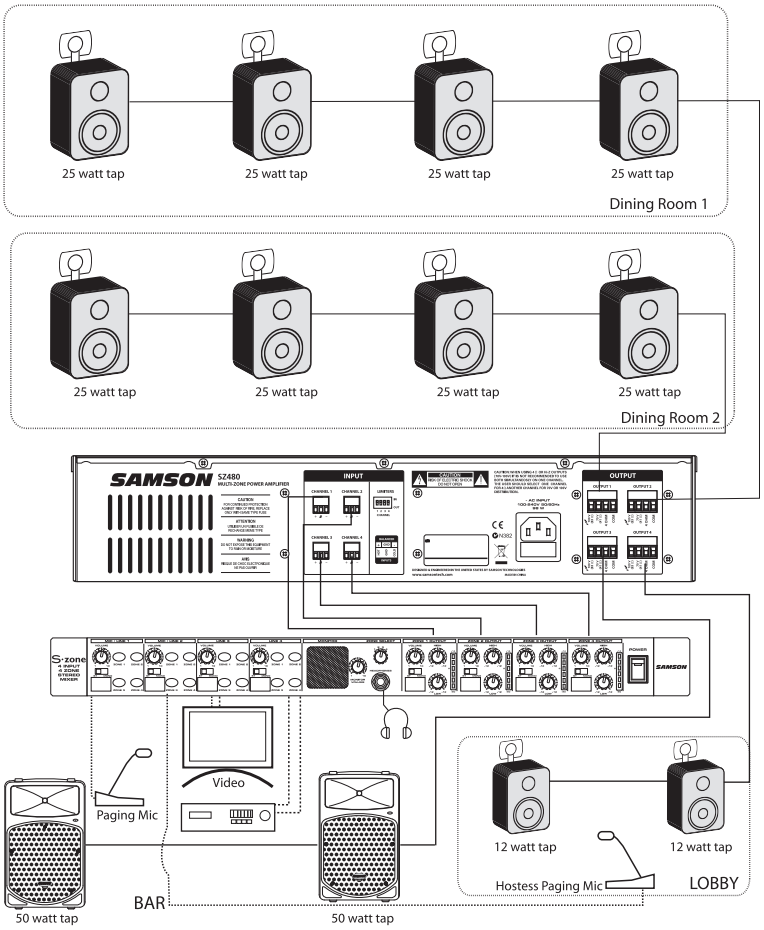
Before you start plugging, stripping and connecting wires, it a good idea to have a clear installation plan. To create your installation plan you need to consider several design parameters including what sound sources will be used, if announcement paging in necessary, which rooms need to have sound, if remote volume control is required, which type of speakers will do the best job for the room they are covering, and your wiring plan.

Selecting the Sound Sources

If you are using multiple sound sources you'll need some type of mixer and for fixed installations, a zone mixer like the Samson S zone is ideal. The S zone provides four input channels with the ability to connect up to six input sources. On input Channel's 1 and 2 there is an input for connecting microphones with phantom power to operate condenser type mics. The S zone also has a special ducking feature so when you speak on the microphone the volume of the music is automatically lowered. You can connect line level signals on all four input channels, so signals from TAPE, CD, DVD or Karaoke players, Audio/Video TV monitors, Radio Tuners, DJ mixers or any other line level device can be used as a sound source. You may also be able to connect the output from a Home Hi-fi receiver if it's equipped with a line level output. For example, in a small to medium size restaurant you may want background music from a CD in one room, Disco Karaoke in another room and have the ability to have a hostess paging parties for their tables, and a cook paging a waitress to pick up an order. The Samson S zone can accomplish all of this easily.

Creating the Audio Zones

You can create separate audio environments using up to four S zone's outputs, each connected to an input channel on the SZ240 or SZ480 amplifier. You can connect one or more speakers with a total load impedance of 4 ohms or more to each output of the SZ series amplifier. Obviously, (or perhaps not so obviously) we call an output a zone on the S zone, but a zone is also the area where you want to have sound. So, think about where you want to distribute the sound. The SZ series amplifiers and S zone can accomplish all of this easily. In addition, the S zone let's you easily connect a remote control level for each of the zones, so you can control the volume in the room even if the audio equipment is located somewhere else.



Designing an Installation Plan

Now, take some time to consider where you need to have sound in your particular installation. After you have decided where you need to create sound zones, you can consider your speaker selection, but first decide where you are going to locate your equipment rack.

Locating Your Equipment Rack

Since the SZ amplifiers and S zone are standard 19-inch rack mount devices, you should consider using an equipment rack, such as one of the Samson SRK series. To select a good location for your equipment rack, you should consider several points including the proximity to each of the sound zones, if the users need to access the gear to change CD's or to adjust a volume level and if you have a convenient location to the electrical service, to name a few. You will need to consider the length of wire runs and routing necessary to make the connections from the equipment rack to the various sound zones. Depending on the speakers you choose, and the length of cable runs you need to make, you may choose to run speaker level or line level to the sound zones. If you are using passive (non-powered) speakers you will need to connect the output channels of the S zone to an input channel of the SZ amplifier and run speaker wire, however you need to be careful to pay attention to the wire gauge and total length of the wire run. If you are using powered (active) speakers you can run long distances using the balanced outputs directly from the S zone. Since the SZ series' and S zone's inputs and output connections are terminated using Euroblock connectors, the wiring can easily be run in advance of the equipment installation.

Another type of installation is one that uses speakers and amplifiers (like the SZ series) with 70-volt transformers, which are commonly referred to as Constant voltage systems. The benefit of a constant voltage system is you can run long lengths of wire and have many speakers connected to a single amplifier. You can also balance the level of each speaker by using one of the available transformer settings. The SZ240 and SZ480 amplifiers are ideal for this thanks to their built-in 70/100 volt output transformers.

Selecting Speakers for Each Zone

To select the speakers, you need to consider a few important issues like where you are going to place your power amplifiers, using powered or un-powered speakers, or if you need to run a 70-volt distributed sound system. The following sections provide a brief overview on how to connect active and passive speakers or a constant voltage system in a typical installation.

Using Active Speakers

In a larger installation, you may use a combination of passive speakers connected to your SZ series amplifier along with some active, or self powered speakers in a different zone. When using active speakers, you can connect the S zone's outputs using the balanced line level signals. In this case you will run line level signal from the S zone's Zone Output over the long wire run to the input of the powered speaker located in the sound zone. For more information on wiring for balanced signals, see the wire guide on page 14 of this manual.

Using Passive Speakers

If you are using passive (un-powered) speakers, you need to first decide where you will place your power amplifier. If the speakers in a particular sound zone are less than 100 feet away you can locate your SZ240 or SZ480 power amplifier in the same rack as the S zone and wire the speaker wires from the amplifier to your sound zone.

NOTE: This type of wiring is known as "home-run wiring" since you are making direct connection from the amplifiers in the equipment rack to the speakers located in the sound zone room.

In this case, you would connect the S zone's Zone Output to the SZ series Input and then run the speaker wires to the passive speakers. Be sure to check the impedance of speakers you are using. Each channel of the SZ series amplifiers can run at 4 ohms, so connect one 4 ohm or two 8 ohm speakers on each SZ output channel. If the speakers in a particular sound zone are further than 100 feet, you should consider placing the amplifier in the same room as the sound zone or use a constant voltage speaker system.

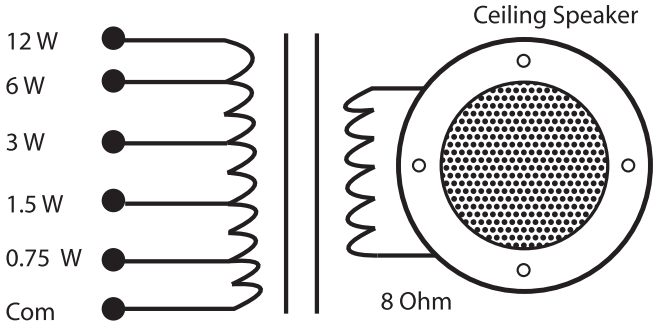
Using A Constant Voltage Speaker System

If your installation requires multiple speakers and long cable runs you should consider running a 70 volt, constant voltage system. Constant voltage systems became the installation standard in the mid-1900's offering a cost effective solution for installations using multiple speakers and long cable runs. The idea was borrowed from the cross-country power grid where voltage is stepped up and therefore the current is reduced allowing huge amounts of power to run over long distances on relatively small, lower cost cable. Ultimately the voltage is stepped down and delivered to the customer over a short, heavy gauge cable.

Using A Constant Voltage Speaker System - continued
The same principle is applied in constant voltage audio systems where a transformer is connected to the amplifier's output to step up the voltage while lowering the output current, which allows you to use long runs of lower gauge wire to connect to a series of speakers with step down transformers. For further cost savings, the 70 volt standard was adopted in the US since UL requires the use of conduit on line over 100 volts, peak to peak. In addition to 70 volt operation, the SZ series amplifiers can also operate 100 volt systems which is a standard in Europe. Commercial sound systems, like those installed in schools, office building and restaurants commonly make use of constant voltage distributed sound systems when a large number of ceiling speakers are used to cover several different sound zones.

Today, there are a large number of installation speakers available from various manufacturers that include onboard transformers for constant voltage systems. Many of these models, like the Samson dB300i, include selectable power taps on the transformer allowing you to distribute the power efficiently through the number of installed speakers and also adjust some speakers to different output levels. The SZ series amplifiers have built in transformers on each channel that step up the output voltage and reduce the current allowing you to connect to a series of speakers with step down transformers over long cable runs. Constant voltage systems can use 14 to 18 gauge wire, with smaller gauge (larger diameter) cable should be used for longer runs.

A simple way to think about using constant voltage is to divide the total watts available by the number of speakers you want to use. You could also add up the speaker's step up transformer wattage to equal 100 watts or less. For example, if you want to use ten ceiling speakers on one channel of the SZ amplifier, use a ceiling speaker with a 12-watt transformer tap (120 watts divided by 10 speakers equals 12-watts per speaker).

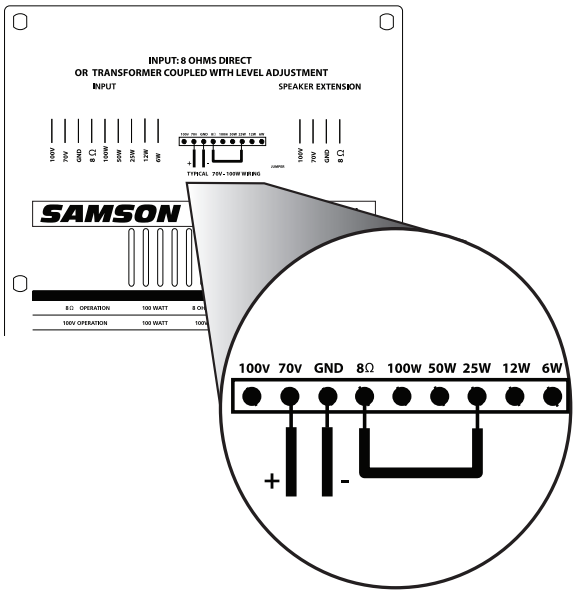


Typical ceiling speaker with onboard transformer and six power taps. These power taps also control volume level for sound balancing.

Another example is connecting four of the Samson dB300i with the transformers wired for 25 watts to each channel of the SZ series amplifier.

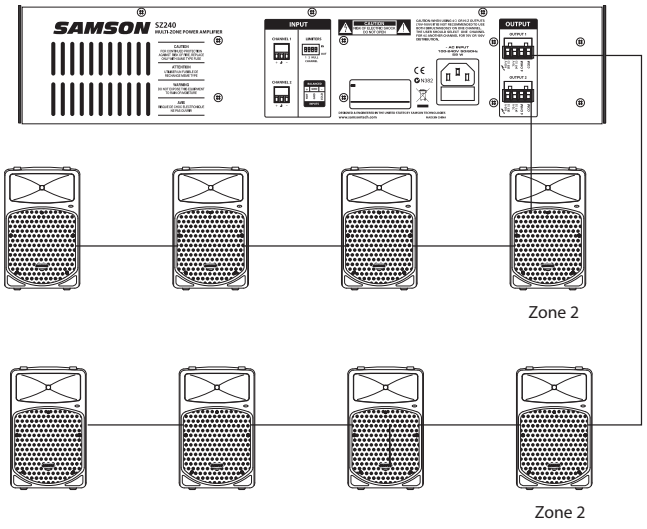
Following the wiring diagram on the rear of the dB300i, connect the ground to Common, the Hot lead to 70 volt input, and finally, run a jumper from 8 ohms to the 25 watt connection as shown in the diagram below.

Set up each of the dB300i they same way so that the four connected speakers equal 100 watts.

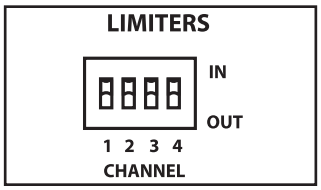


The dB300i's rear panel is configured for 70 volt 25 watt operation.

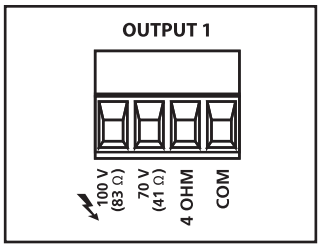
Now connect the four speakers to each of the SZ240's output as shown in the diagram below.



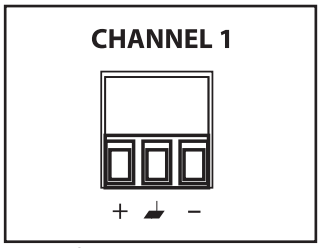
Setting Up and Using Your SZ Series



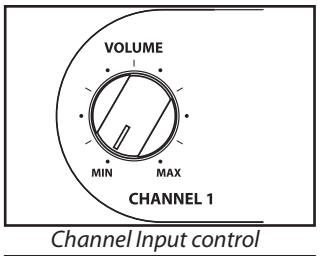
Channel Limiter switches



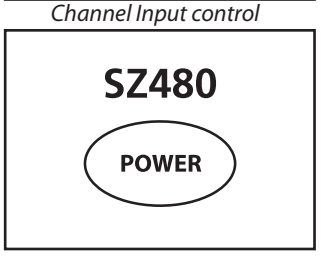
Output connectors



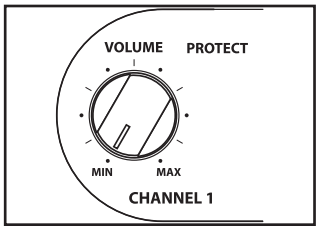
Input connectors



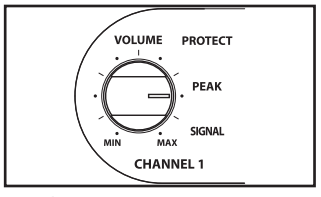
Channel Input control



Protection LED



Protection LED



Three-segment LED meter

Setting up your SZ Series is a simple procedure which takes only a few minutes:

1. Remove all packing materials (save them in case of need for future service) and decide where the amplifier is to be physically placed—it can be used free-standing or mounted in a standard 19" rack, requiring only two rack spaces. When installed, make sure that both the front and rear panels are unobstructed and that there is good ventilation around the entire unit (we recommend the use of spacer panels, especially if multiple amplifiers are used in a rack.

2. Set the rear panel Limiter switches as desired for each channel. In order to help insure a clean signal and to protect the speaker system, we recommend the Limiter switch be set to the "on" position for just about every application.

3. Make the speaker connections, using the Euroblock output connectors on the rear panel. It is never a good idea to power up any amplifier that is not connected to loudspeakers. When operating using the 4 ohm output, any loudspeakers with a minimum impedance load of 4 ohms (that is, 4 ohms or greater) can be used. The SZ series amplifier channels can not run in bridge mode. In Stereo or Parallel mode, make sure the 4 ohm terminal is connected to the positive input of the speaker and the COM (ground) terminal is connected to the negative input of the speaker. For 70 volt operation, connect the positive input of the speaker to the 70 volt terminal and connect the negative input the COM (ground) terminal. When operating a 70 volt system full power is achieved at 41 Ohm and at 100 volt operation full power is achieved at 83 Ohms. For 100 volt operation, connect the positive input of the speaker to the 100 volt terminal and connect the speaker's negative input to the COM (ground) terminal. When operating a 100 volt system full power is achieved at 83 Ohms.

4. Next, make the signal input connections, using the Euroblock input connectors on the rear panel. If your mixer has balanced outputs, we recommend the use of three-conductor cabling and connectors (unbalanced two-conductor connections can also be used, but you'll get better signal quality and less outside noise and hum if you use balanced lines).

5. On the front panel of the SZ Series, turn all the Channel input controls fully counterclockwise (to their "MIN" setting). Then connect the supplied heavy-gauge 3-pin "IEC" cable to the rear panel IEC connector and to any grounded AC socket.

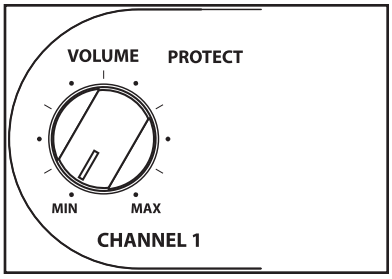
Because of the relay protection circuitry built into the SZ Series, you can even plug it into the same power strip that other audio devices (such as a mixing console) are connected to. You can then turn on all devices at once with the single power strip on-off switch, with no danger of damaging connected speakers by generating "thumps."

6. Press the front panel Power switch in order to turn on the SZ Series. The Power LED will light and the Protection LED will go on. After approximately five seconds, the Protection LED will go off (you'll hear a click when this occurs).

7. Apply an input signal to the SZ Series at or about +4dBu (if sending signal from a mixer, drive the output meters at approximately 0 vu). While the input signal is present, slowly raise the Channel Input controls until the desired sound level is achieved. The SIGNAL and PEAK LED indicators next to each Channel input control will show you the continuous power output of the SZ Series as signal is being passed. For the best signal-to-noise ratio, the SZ Series should normally be run with the Channel Input controls at or near maximum (fully clockwise, at the "MAX" position) and the PEAK segments should light occasionally (but not frequently) during peak levels. If you are using a mixer that has a master output level control, use it to attenuate the signal as necessary to achieve the desired speaker level.

If you encounter difficulty with any aspect of setting up or using your SZ Series, contact your local Samson dealer. If purchased in the United States, you can call Samson Technical Support (1-800-372-6766) between 9 AM and 5 PM EST.

The SZ Series Protection Circuitry



As noted in the "Guided Tour" section of this manual, the SZ Series front-panel Protection LED indicates the activity of the relay speaker connection circuitry. When the Protection LED is lit, this circuitry is active, and all connected speakers are muted (provided with no signal), thus protecting them and preventing any audible "thump" from occurring.

The following conditions will cause the Protection LED to go on:

• *Initial power-up:* For approximately five seconds after initial power-up, the protection circuitry is activated and the speaker outputs are muted. If everything is operating normally, you will hear an audible click at the conclusion of this brief period, as the protection circuitry is deactivated and the SZ Series begins delivering signal to connected speakers (at which point you'll hear the click). It is normal for the Protection LED to fade gradually after the amplifier is powered off.

• **WARNING: If the Protection LED fails to go out (and you fail to hear the accompanying audible click) approximately five seconds after power-up, turn the SZ Series off immediately and check all external devices and wiring for possible shorts or other defects.**

Overheating: A temperature sensing device in the SZ Series will cause the protection circuitry to be activated (and the Protection LED to go on) whenever the operating temperature of the unit rises above a safe level. To guard against this problem, make sure the SZ Series receives adequate ventilation on all sides and that both the front and rear panels are unobstructed.

• *Severe over current conditions:* This occurs whenever the signal being input to the SZ Series rises to a level above 20% THD (Total Harmonic Distortion).

• *Shorted speaker cables:* This will occur if, due to faulty wiring, the hot and ground signals being output by the SZ Series are shorted to one another.

• *Output impedance drops below 2 ohms*: This can occur if the SZ Series is connected to inappropriate speaker systems (see the "Setting Up and Using Your SZ Series" section on page 10 in this manual for more information).

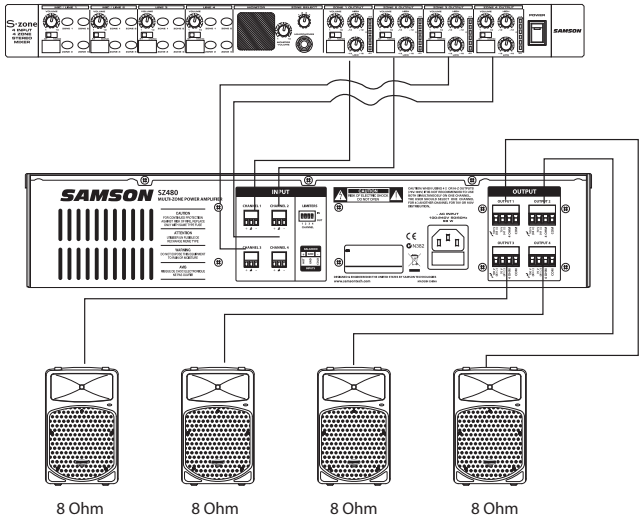
• *DC voltage detected at speaker output*: The most likely cause of this is an internal failure.

In general, any time the Protection LED lights up (other than during the approximately five seconds following initial power-up), there is reason to be concerned. If this occurs, turn the SZ Series off immediately and carefully check all wiring and external devices in order to locate and correct the condition that caused the LED to light up in the first place.

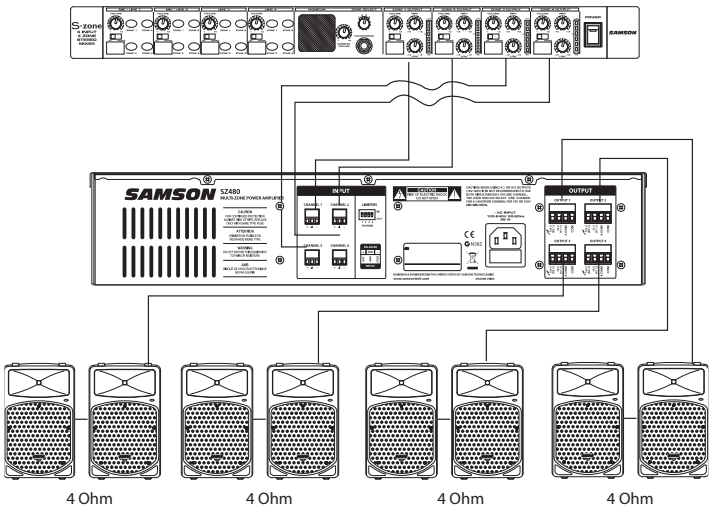
For further assistance, contact your local Samson dealer. If purchased in the United States, you can call Samson Technical Support (1-800-372-6766) between 9 AM and 5 PM EST.

SZ Series Connections

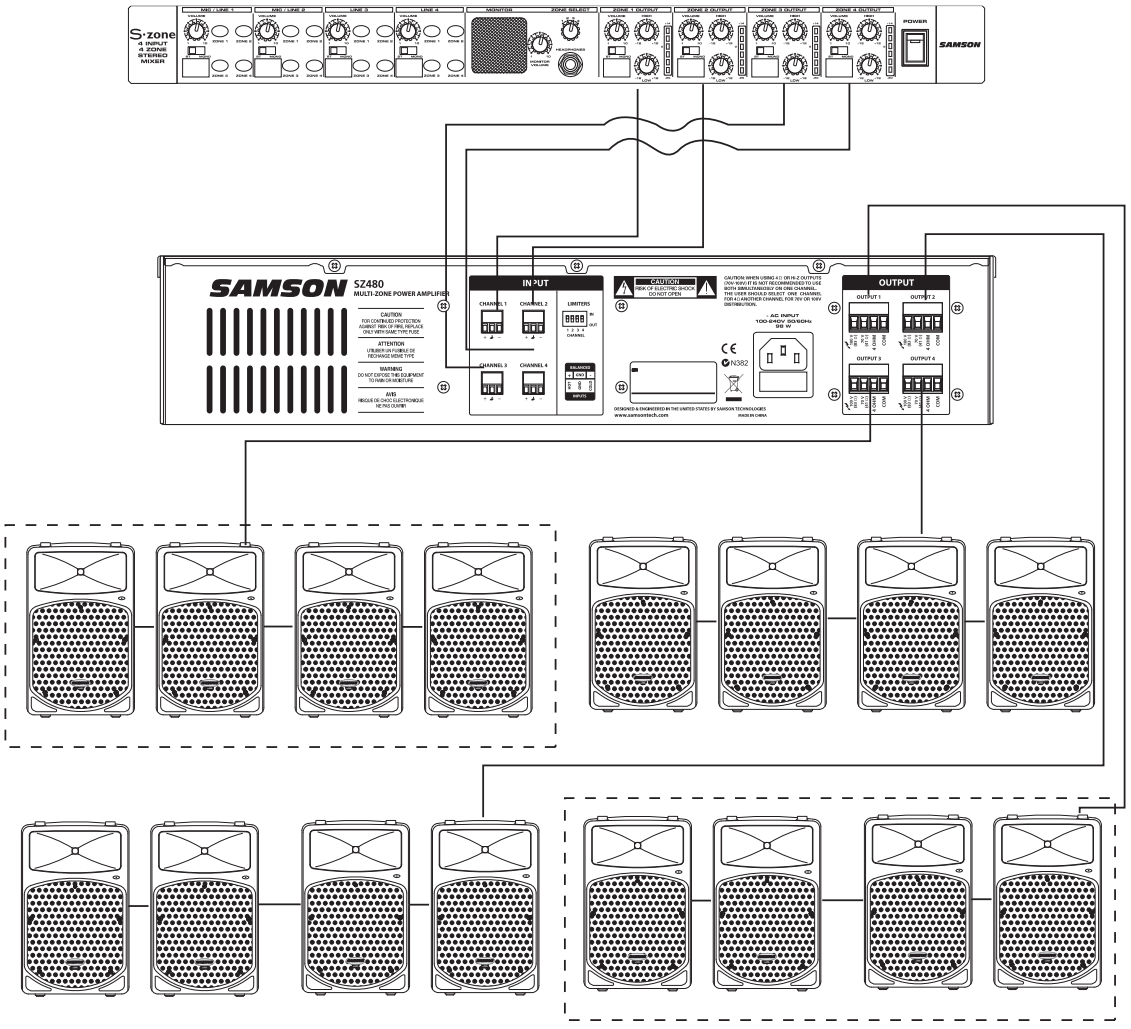
The following diagrams illustrate various wiring set ups for 4 ohm, 8 ohm and 70 Volt operation.



8 Ohm Operation (One 8 Ohm speaker per amplifer)



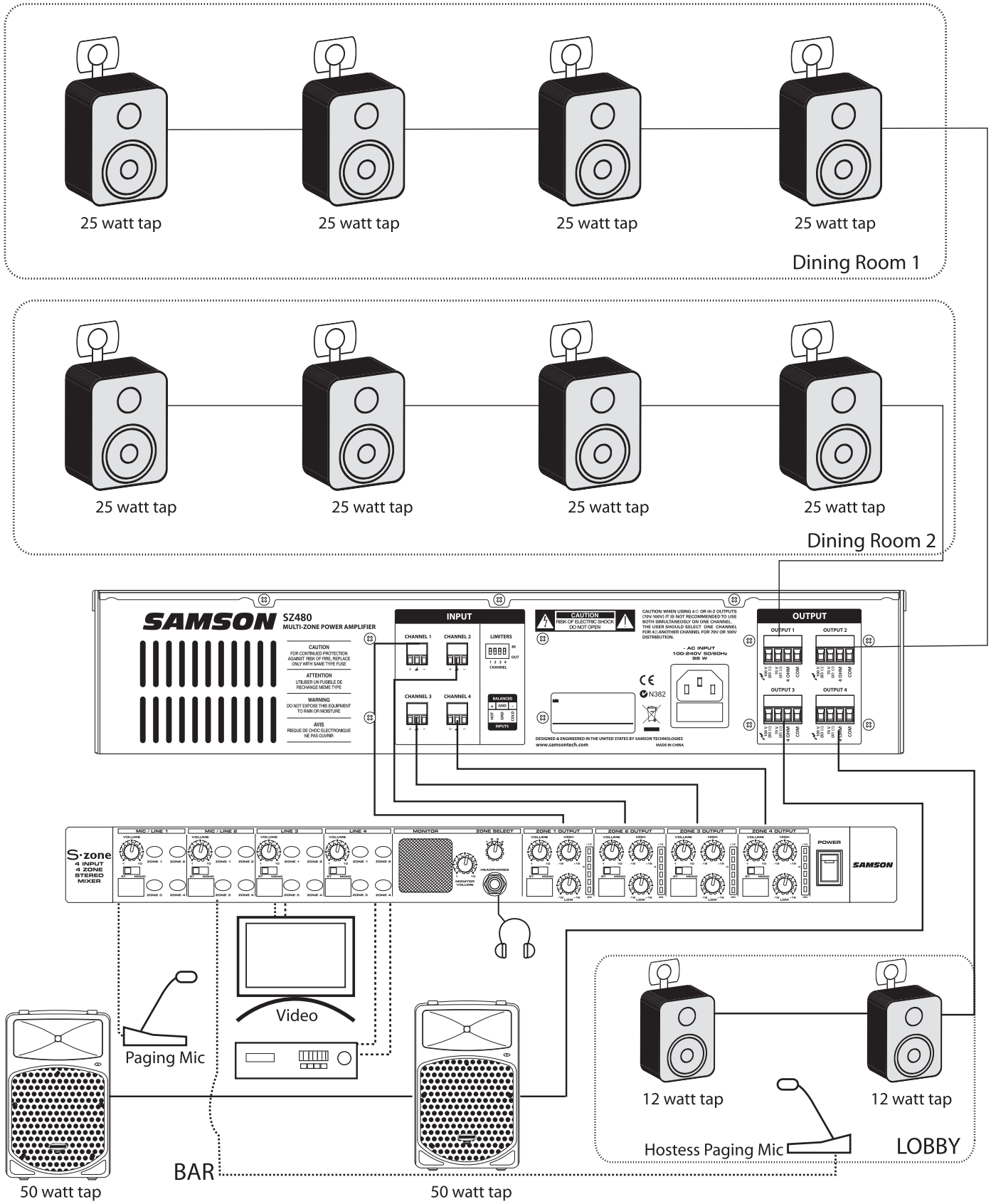
4 Ohm Operation (Two 8 Ohm speakers per amplifer)



70 Volt Operation (Four speakers per amplifer with their line transformers set to 25 watt)

SZ Series System Set Up

The following is a typical constant voltage system setup for a small restaurant using the SZ480 power amplifier along with an S zone feeding several audio zones with paging and music. The first two SZ amp channels are connected to four wall-vmounted speakers in each of the Dining Rooms with their transformers set to a 25 watt tap. The third SZ amp channel powers two speakers in the outside Bar area with their transformers set to 50 watt. (The db300i's are specially treated so they're suitable for indoor and outdoor use.) The fourth SZ amp channel powers small speakers in the lobby with a 12 watt tap.

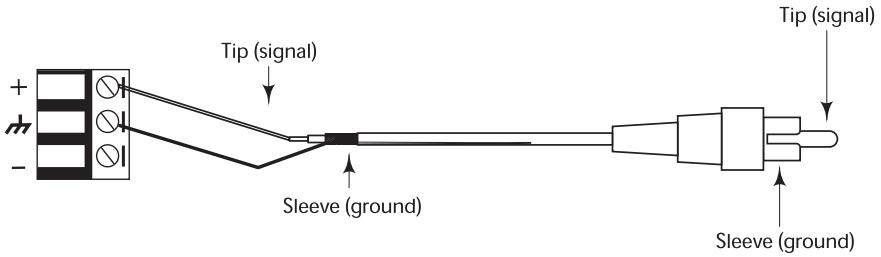


SZ series Input Wiring Guide

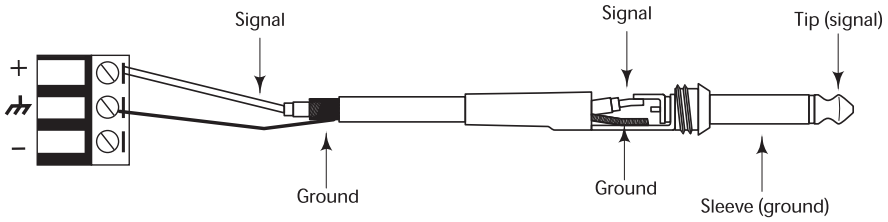
SZ Series Input Wiring Guide

There are several ways to interface the SZ series amplifers, depending on your exact system set-up. Follow the cable diagrams below for connecting to the input of your amplifier.

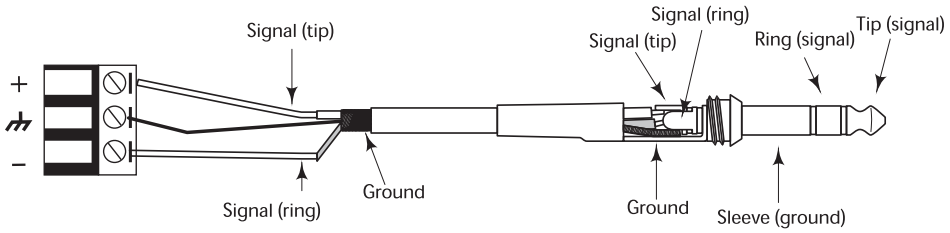
Euroblock to RCA (Unbalanced)



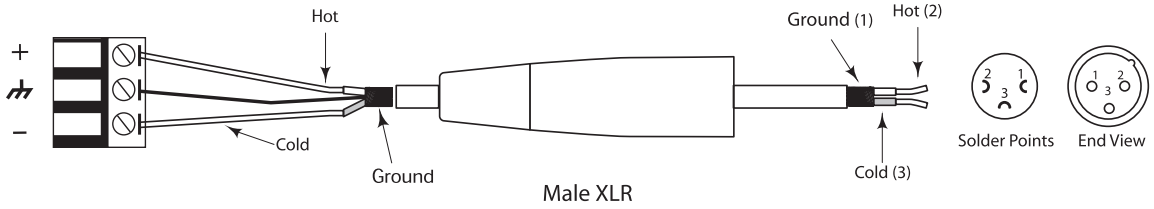
Euroblock to 1/4-inch (Unbalanced)



Euroblock to1/4-inch (Balanced)



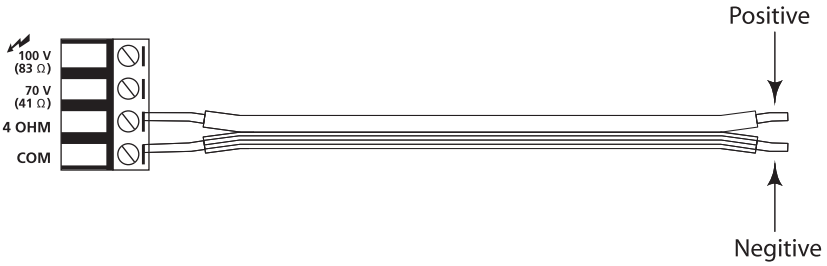
Euroblock to Male XLR (Balanced)



SZ Series Output Wiring Guide

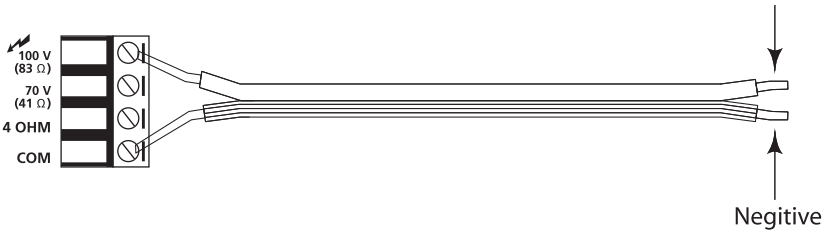
There are several ways to interface the SZ series amplifers, depending on your exact system set-up. For most small installation 14 to 16 gauge zip cord can be used for most small to medium size installations. Follow the cable diagrams below for connecting to the input of your amplifier.

4 and 8 Ohm Wiring Guide



70 Volt Wiring Guide

100 Volt Wiring Guide



SHOCK HAZARD SYMBOL

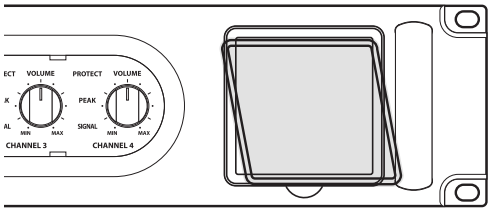
WARNING!!! - PAY ATTENTION TO THE WARNING SYMBOL AND AVOID ELECTRICAL SHOCK. DO NOT HOLD OR TOUCH THE COMMON AND 70 OR 100 VOLT WIRE CONNECTION WHILE OPERATING THE AMPLIFIER.

Cleaning the Fan Filters

Cleaning the Fan Filters

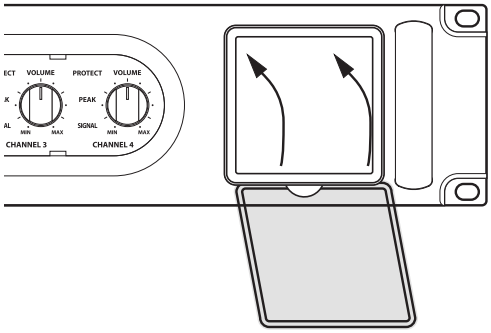
From time to time, it may become necessary to clean the fan filters. It's a good idea to keep the fan filters clean to ensure maximum airflow, and cooling, through your SZ Series amplifier. To clean the fan filters follow these simple steps.

1/ Remove the fan filter by placing your finger in the depressed area under the fan filter frame.



2/ Clean the filter with warm water and let the filter dry thoroughly before replacing.

3/ Replace the fan filter by aligning the frame to the top of the panel knock-out, and then, snap the frame back in place.

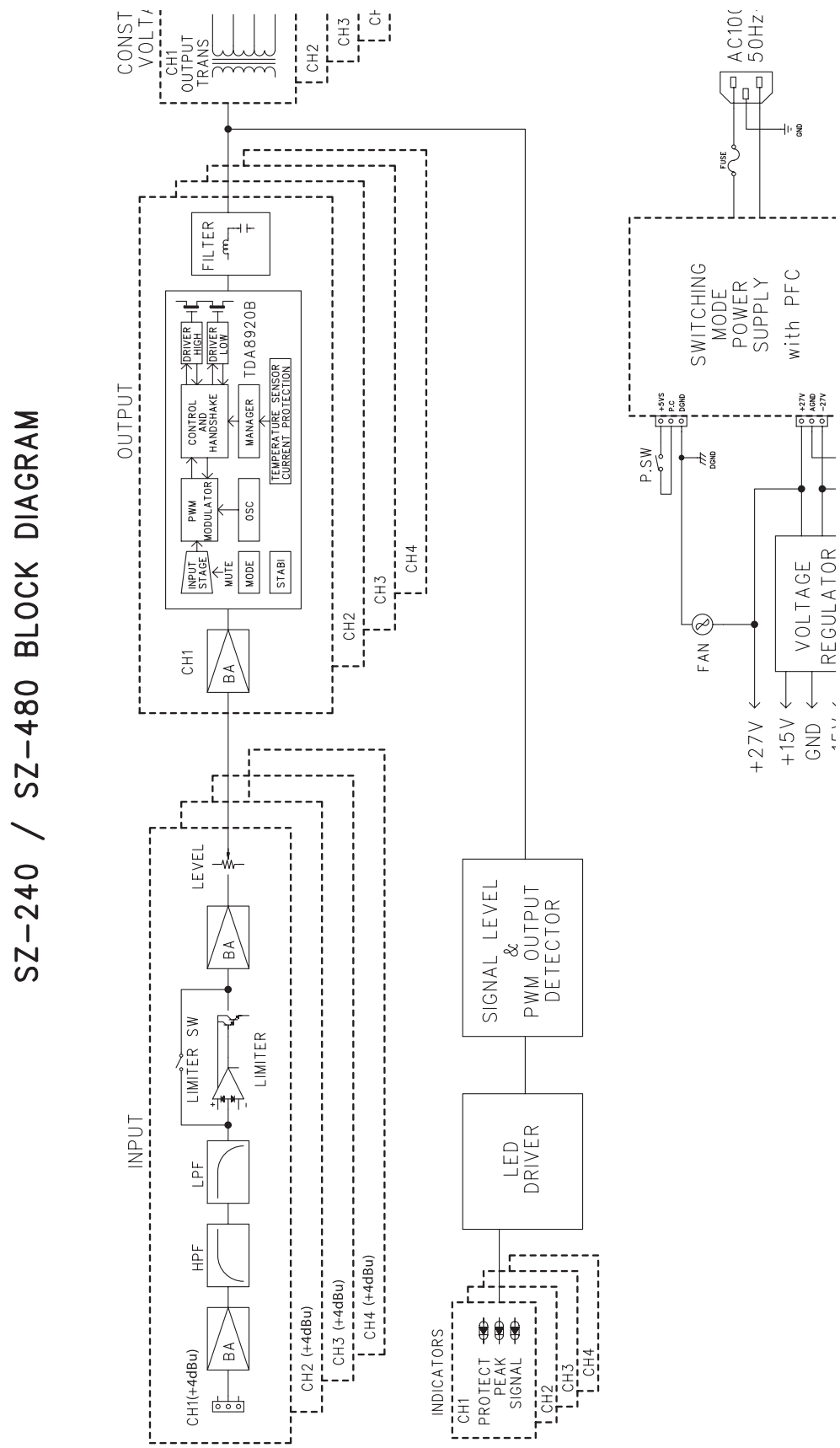


Specifications

	SZ240	SZ480
All channels driven		
8 ohms	65 Watts	65 Watts
4 ohms	120 Watts	120 Watts
Current Consumption(115VAC)		
@1/8 rated power 4ohms	0.3A	0.6A
@1/3 rated power 4ohms	0.8A	1.6A
@ rated power 4ohms, max.	2.5A	5.0A
Input Sensitivity (Balanced Line Input)	1.0 + 0.2Vrms / 10Kohm	
Frequency Response (50Hz~18kHz)	+1.5/-3dB	
Dynamic Range	>90 dB A-weighted, typical	
THD+N (AES17 20kHz brickwall filter, Rated output)	Less than 5%	
S/N Ratio (AES17 20kHz brickwall filter)	90dB	
Residual Noise (AES17 20kHz brickwall filter)	-70dB	
Input Clipping	+22dBu	
Connectors (each channel)		
Input:	Active balanced Euroblock	
Output:	Euroblock	
Controls	AC power switch,Channel volume, Limiter	
Indicators	Power on(blue),Protection(amber)	
	Signal(green) for each Ch.,Peak(red) for each Ch.	
Protection	Short circuit,Thermal,Current limit,DC offset,Current inrush,RF protection, Turn on/Turn off muting	
Cooling	Continuously variable speed, fan forced air	
Transformer Rating.	120 Watts	
Input voltage	28.28 Vrms 100 watts / 8_	
Output Tap 1: Voltage	70.7 Vrms 50_ load	
Output Tap 2: Voltage	100 Vrms 100_ load	
Output Tap 3: Voltage	20 Vrms 4_ load	
Power Requirements	100/115/220/230/240 VAC, 50/60 Hz	
Construction	All Steel	
Dimensions(WXHXD)	19"(483mm)X3.5"(89mm)X16"(408mm)	
Net Weight	322.5lb.(10.2kg)	32lb.(14.5kg)

Specifications are subject to change without notice.

Block Diagram



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